

Replacement Gas Furnace Check List

Customer: _____ **Contractor:** _____
Telephone: _____ **Brand/Model #:** _____
Date Installed: _____ **Serial #:** _____
WisWap BID#: _____ **or WHEAP Agency:** _____

Inspection/Adjustments

PMI=per manufacturer's instructions

(✓ box, enter test results or requested number as item is inspected or completed. Indicate "N/A" if not applicable. Use comments box on P.2)

Fuel Type: ☐ Natural Gas ☐ Propane

Documents: ☐ Photos documenting furnace conditions and manufacturer nameplate were provided to Agency
☐ Installation information sticker (*installer name, phone number, date*)
☐ Warranty and manual in envelope attached to the furnace cabinet
☐ Agency given copy of sizing calculation Design temperature heat loss calculation: _____ BTU/Hr

Electrical: ☐ Service disconnect is present and is operational
☐ Dedicated circuit and fuse or circuit breaker properly rated
☐ Set heat anticipator (thermostat) PMI ☐ Not applicable

Gas Piping: ☐ Sized for BTUs of all appliances ☐ No leaks ☐ Shut off present
☐ CSST bonded ☐ Sediment trap present

Air Filter: ☐ Filter opening covered/sealed ☐ Filter removes easily with no obstructions Size: _____ X _____ X _____

General: ☐ Furnace elevated off basement floor. *Note: If not in basement, can be on floor if okay per PMI.*
☐ Condensate properly drained per local code and PMI
☐ Combustion air and exhaust piping properly installed, terminated, and supported ☐ Sealed test holes
☐ Distribution plenums sealed; all major duct leaks properly sealed per specs
☐ Orphaned water heater has proper draft (see page 2 for acceptable draft results)

Installed and Measured BTU's of new furnace:

BTUs (high input): _____ Measured Input (2 cu. Ft of Gas): _____ Minutes: _____ Seconds: _____

BTUs (low input): _____ (if applicable) Measured Input (2 cu. Ft of Gas): _____ (if applicable) Minutes: _____ Seconds: _____

Measured Gas Pressure [Inches of water column (IWC)]:

Input (High): _____ Input (Low): _____ (If applicable) Manifold (High): _____ Manifold (Low): _____ (If applicable)

Performance Testing

(Enter test result. Indicate "N/A" if installation is space heater.)

Steady State Efficiency Test

Adjust to achieve Typical Ranges for Gas Burning Appliances (See page 2)

Distribution Static Pressure

Measured in supply plenum and blower cabinet

SSE % O₂ % CO ppm Intake Air °F Flue °F PMI AFUE %

☐ IWC ☐ Pa Measured in supply plenum and blower cabinet
 Return Supply Total Max. ESP
 Pressure Pressure Pressure on label

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

High Input
Low Input
(If applicable)

_____	_____	_____	_____
_____	_____	_____	_____

Temperature Rise

Supply °F Return °F (Supply - Return) PMI Min PMI Max

Air Flow Rate Testing Results

Heating CFM Fan Speed Setting

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

High Input
Low Input
(If applicable)

_____	_____
_____	_____

☐ Plate Method ☐ Fan Tables ☐ Other

List Other: _____

I certify that the visual inspection and the performance tests were completed as indicated.

I certify that the heating system was installed to my satisfaction on the date indicated.

Installer's Signature _____ Date _____

Customer's Signature _____ Date _____

Name (Print legibly) _____

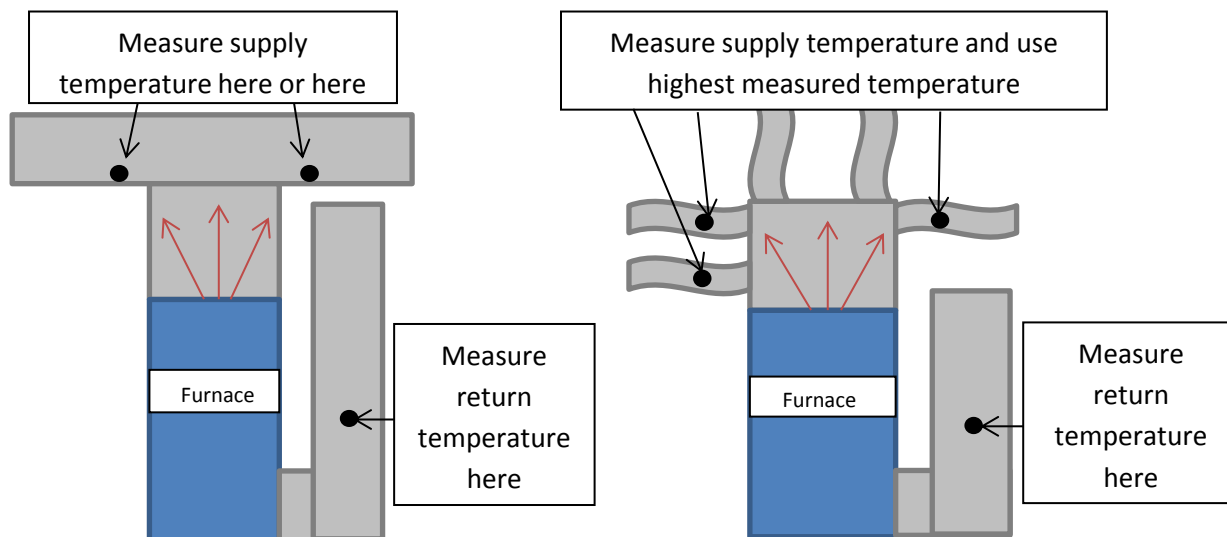
Name (Print legibly) _____

Natural Gas and Propane Gas Specifications

Generally accepted ranges, excerpted from the Weatherization Field Guide.

Note: Always follow manufacturer's instructions, if they differ from listed specifications.

Examples of temperature rise testing procedures below



Acceptable Draft Test Readings for Gas Appliances with Respect to Outdoor Temperature					
°F	<20	21-40	41-60	61-80	>80
pa.	-5	-4	-3	-2	-1
IWC.	-.02	-.016	-.012	-.008	-.004

Table 3.2: Typical Ranges for Gas Burning Appliances		
Performance Indicator	SSE 80+	SSE 90+
Carbon monoxide (CO) (ppm)	≤ 100	≤ 100
Stack temperature (°F)	325° - 450°	90° - 120°
Temperature Heat Rise (°F)	40° - 70°	30° - 70°
Oxygen (%O ₂)	4 - 9%	4 - 9%
Natural gas pressure output at manifold - Inches of Water Column (IWC)	3.2 - 3.9 IWC	3.2 - 3.9 IWC
Propane pressure output at manifold (IWC)	10 - 11 IWC	10 - 11 IWC
Steady-state efficiency (SSE)	82 - 86%	92 - 97%
Supply temperature (°F)	120° - 140°	95° - 140°

Comments:

Replacement Oil Furnace Check List

Customer: _____
 Telephone: _____
 Date Installed: _____
 WisWap BID#: _____

Contractor: _____
 Brand/Model #: _____
 Serial #: _____
 or WHEAP Agency: _____

Inspection/Adjustments

PMI=per manufacturer's instructions

(✓ box, enter test results or requested number as item is inspected or completed. Indicate "N/A" if not applicable. Use comments box on P.2)

Documents: ☐ Photos documenting furnace conditions and manufacturer nameplate were provided to Agency
☐ Installation information sticker (*installer name, phone number, date*)
☐ Warranty and manual in envelope attached to the furnace cabinet
☐ Agency given copy of sizing calculation Design temperature heat loss calculation: _____ BTU/Hr

Electrical: ☐ Service disconnect is present and is operational
☐ Dedicated circuit and fuse or circuit breaker properly rated
☐ Set heat anticipator (thermostat) PMI ☐ Not applicable

Fuel Supply: ☐ New fuel filter ☐ Tank / lines comply with NFPA 31
☐ No leaks ☐ Purged fuel lines

Air Filter: ☐ Filter opening covered/sealed ☐ Filter removes easily with no obstructions Size: X X

General: ☐ Furnace elevated off basement floor.
☐ Acceptable clearances of heating unit and its vent connector to nearby combustibles per NFPA 31
☐ Chimney inspected for compliance with NFPA 211
☐ Barometric damper control operates properly
☐ Distribution plenums sealed; all major duct leaks properly sealed per specs
☐ Sealed test holes

Measured BTU's for new furnace:

BTUs (input): _____ Nozzle GPH: _____ Nozzle Angle: _____ ° Nozzle Spray Type: _____

Note: The oil nozzle information is required to be posted on the furnace with the date of installation

Measured Oil Pressure [Pounds Per Square Inch (PSI)]:

(PMI) _____ PSI

Measured _____ PSI

Performance Testing

(Enter test result. Indicate "N/A" if installation is space heater.)

Draft Measurements

Flue Draft (Before barometric damper 10-15 Pa or 0.04-0.06 IWC or PMI)

Overfire Draft (Must be a minimum of 5 Pa. or 0.02 IWC or PMI)

Measured Smoke Number

Smoke Spot Scale #

Steady State Efficiency Test

Adjust to achieve Typical Ranges for Oil Burning Appliances (see page 2)

Combustion

SSE %	O ₂ %	CO ppm	Air °F	Flue °F	PMI AFUE %
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Distribution Static Pressure

Measured in supply plenum and blower cabinet

<input type="checkbox"/> IWC	Return	Supply	Total	Max. ESP
<input type="checkbox"/> Pa	Pressure	Pressure	Pressure	on label
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Temperature Rise

Supply °F	Return °F	(Supply - Return)	PMI Min	PMI Max
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Air Flow Rate Testing Results

Heating CFM Fan Speed Setting

<input type="text"/>	<input type="text"/>
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☐ Plate Method ☐ Fan Tables ☐ Other

List Other: _____

I certify that the visual inspection and the performance tests were completed as indicated.

I certify that the heating system was installed to my satisfaction on the date indicated.

Installer's Signature _____ Date _____

Customer's Signature _____ Date _____

Name (Print legibly) _____

Name (Print legibly) _____

Fuel Oil Heating System Specifications

Generally accepted ranges, excerpted from the Weatherization Field Guide.

Note: Always follow manufacturer's instructions, if they differ from listed specifications.

Examples of temperature rise testing procedures below

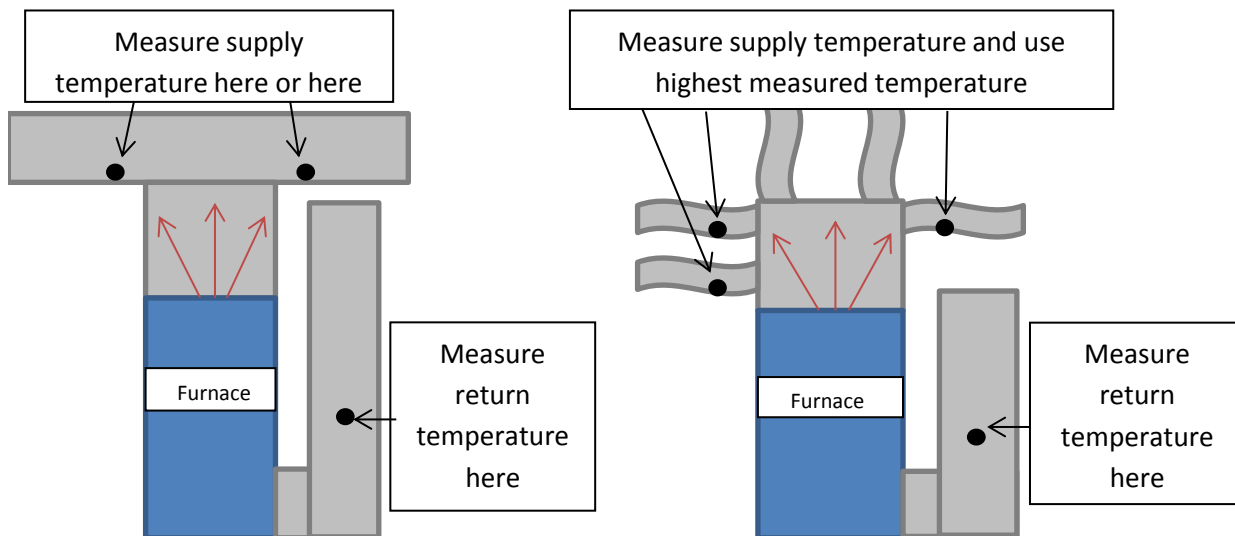


Table 3.5: Typical Ranges for Oil Burning Appliances

Performance Indicator	Non-Flame Retention	Flame Retention
Carbon monoxide (CO) (ppm)	≤ 100	≤ 100
Stack temperature (°F)	325° - 550°	300° - 450°
Oxygen (%O ₂)	6 - 9%	5 - 9%
Smoke number (1-9)	≤ 2	≤ 1
Excess air (%)	$\geq 80\%$	$\geq 35\%$
Oil pressure pounds per square inch (psi)	≥ 100	100 - 150
Over-fire draft (Inches of Water Column - IWC negative)	.02 IWC or 5 Pa	.02 IWC or 5 Pa
Flue draft (IWC negative)	.04 - .01 IWC or 10 - 15 Pa	.04 - .01 IWC or 10 - 15 Pa
Steady state efficiency (SSE)	$\geq 75\%$	$\geq 80\%$

Comments:

Replacement Boiler Check List

Customer: _____
 Telephone: _____
 Date Installed: _____
 WisWap BID#: _____

Contractor: _____
 Brand/Model #: _____
 Serial #: _____
 or WHEAP Agency: _____

Inspection/Adjustments

PMI=per manufacturer's instructions

(✓ box, enter test results or requested number as item is inspected or completed. Indicate "N/A" if not applicable. Use comments box on P.2)

Fuel Type: ☐ Natural Gas ☐ Propane ☐ Oil

Documents: ☐ Photos documenting boiler conditions and manufacturer nameplate were taken and provided to Agency
☐ Installation information sticker (*installer name, phone number, date*)
☐ Warranty and manual in envelope attached to the furnace cabinet
☐ Agency given copy of sizing calculation Design temperature heat loss calculation: _____ BTU/Hr

Electrical: ☐ Service disconnect is present and is operational
☐ Dedicated circuit and fuse or circuit breaker properly rated
☐ Set heat anticipator (thermostat) PMI ☐ Not applicable

Gas Piping: ☐ Sized for BTUs of all appliances ☐ No leaks ☐ Shut off present
☐ CSST bonded ☐ Sediment trap present

Fuel Oil: ☐ New Fuel Filter ☐ Tank/lines comply with NFPA 31 ☐ No leaks ☐ Purged Fuel Lines

General: ☐ Boiler elevated off basement floor. *Note: If not in basement, can be on floor if okay per PMI.*
☐ Check clearances of heating unit and its vent connector to nearby combustibles [Gas: IFGC; Oil: per NFPA 31]
☐ Installed Pressure Relief Valve: PMI
☐ Combustion air and exhaust piping properly installed, terminated, and supported ☐ Sealed test holes
☐ Barometric controls operate properly: PMI (if applicable)
☐ Bled air from the entire system
☐ Condensate properly drained per local code and PMI
☐ Orphaned water heater has proper draft (see page 2 for acceptable draft results)

Existing Load Terminals and Capacity:

Radiation Type: ☐ Fin Tube ☐ Radiator ☐ Baseboard ☐ Other: _____
 Linear Feet: _____ (Fin Tube or Cast Iron Baseboard) Square Feet: _____ (Radiators)

Measured BTU's for new boiler:

Design Temperature Used _____ °F Modulating Boiler Turndown Ratio (if applicable) _____ : _____
 BTUs (input): _____ Measured Input (2 cu. Ft of Gas): _____ Minutes: _____ Seconds: _____
 Nozzle GPH: _____ Nozzle Angle: _____ ° Nozzle Spray Type: _____

Measured Gas Pressure [Inches of water column (IWC)] or Oil PSI:

Input: _____ Manifold (High): _____ Manifold (Low): _____ Oil: _____ PSI
 (if applicable)

Installed Devices: Indicate what was installed. Steps must be taken to prevent condensation in non-condensing units.

☐ Air excluding device ☐ Mixing valves ☐ Automatic fill valve ☐ Backflow preventer ☐ Other: _____
☐ Wye Strainer ☐ Outdoor Sensor (install on North wall) ☐ Circulator Pump _____ HP _____ GPM _____ W
 Size Speed Setting Watts

Performance Testing and Boiler Setup

Combustion and Draft Testing

Adjust to achieve Typical Ranges for Applicable Appliance (on page 2)

Select one CO ₂ or O ₂	<input type="checkbox"/> CO ₂ % <input type="checkbox"/> O ₂ %	CO ppm	Draft: <input type="checkbox"/> IWC <input type="checkbox"/> Pa	Intake Air °F	Flue °F	SSE %	PMI AFUE %
High Input (Test Results)							
Low Input (If applicable)							
High Input PMI (PMI Range)				Overfire Draft (if applicable)			
Low Input PMI (If applicable)				Smoke Test # (if applicable)			

Actual Boiler Setup

Warm
Weather
Shut Down Design
Conditions

Outdoor Temp °F		
Boiler Supply Temp °F		
Outdoor °F		
Primary Loop (High Input)	Supply °F	Return °F

Measured
Temperatures

I certify that the visual inspection and the performance tests were completed as indicated.

I certify that the heating system was installed to my satisfaction on the date indicated.

Installer's Signature _____ Date _____

Customer's Signature _____ Date _____

Name (Print legibly) _____

Name (Print legibly) _____

Boiler Natural Gas, LP & Fuel Oil Specifications

Generally accepted ranges, excerpted from the Weatherization Field Guide.

Note: Always follow manufacturer's instructions, if they differ from listed specifications.

Acceptable Draft Test Readings for Gas Appliances with Respect to Outdoor Temperature					
°F	<20	21-40	41-60	61-80	>80
pa.	-5	-4	-3	-2	-1
IWC.	-.02	-.016	-.012	-.008	-.004

Gas: Measure draft halfway between collar and chimney.

Table 3.2: Typical Ranges for Gas Burning Appliances		
Performance Indicator	SSE 80+	SSE 90+
Carbon monoxide (CO) (ppm)	≤ 100	≤ 100
Stack temperature (°F)	325° - 450°	90° - 120°
Oxygen (%O ₂)	4 - 9%	4 - 9%
Natural gas pressure output at manifold - Inches of Water Column (IWC)	3.2 - 3.9	3.2 - 3.9
Propane pressure output at manifold (IWC)	10 - 11	10 - 11
Steady state efficiency (SSE)	82 - 86%	92 - 97%
Supply temperature (°F)	120° - 140°	95° - 140°
Return Water Temperature-Non- condensing (°F)	>130	>130

Table 3.5: Typical Ranges for Oil Burning Appliances		
Performance Indicator	Non-Flame	Flame Retention
Carbon monoxide (CO) (ppm)	≤ 100	≤ 100
Stack temperature (°F)	325° - 550°	300° - 450°
Oxygen (%O ₂)	6 - 9%	5 - 9%
Smoke number (1-9)	≤ 2	≤ 1
Excess air (%)	≥ 80%	≥ 35%
Oil pressure pounds per square inch	≥ 100	100 - 150
Over-fire draft (Inches of Water Column)	.02 IWC or 5 Pa	.02 IWC or 5 Pa
Flue draft (IWC negative)	.04 - .01 IWC or 10 - 15 Pa	.04 - .01 IWC or 10 - 15 Pa
Steady state efficiency (SSE)	≥ 75%	≥ 80%
Return Water Temperature-Non- condensing (°F)	>150	>150

Oil: Measure draft between barometric damper and collar and at over fire.

Comments:

Heating System Repair or Clean and Tune Check List

Customer: _____

Contractor: _____

Telephone: _____

Work Date(s): _____

WHEAP/WX Agency: _____

WisWap BID #: _____

Fuel Type: ☐ Natural Gas ☐ LP/Propane ☐ Oil ☐ Other: _____

System Type: ☐ Forced Air ☐ Boiler ☐ Space Heater ☐ Other: _____

Input on label: _____ Output on label: _____ Measured Input (Clock meter): _____

Clean, inspect, test, and repair: Perform the following inspection procedures and maintenance practices on heating systems as necessary. The goal of these measures is to reduce carbon monoxide (CO), adjust fuel-air mixture, improve steady-state efficiency and verify the operation of safety controls. All holes that are drilled should be properly sealed after completion of testing.

All Systems

(✓ box, enter test results or requested number as item is inspected or completed. Indicate "N/A" if not applicable. Use comments box on P.2)

Emergency shut off	<input type="checkbox"/>	Service disconnect is present and is operational
Electrical service.	<input type="checkbox"/>	Inspect circuit. Rated for application. Note problems, make recommendations.
Fuel lines/storage tanks.	<input type="checkbox"/>	No leaks present. Shut off present. Filter or sediment trap is present and clean.
Blower	<input type="checkbox"/>	Clean.
Air Handler	<input type="checkbox"/>	Clean.
Air Filter	<input type="checkbox"/>	Clean or replace.
Heat exchanger	<input type="checkbox"/>	Clean surface & inspect for leaks; inform customer & agency if exchanger is cracked.
Filter slot/filters	<input type="checkbox"/>	Filter slot with cover is present. Replacement filters/ permanent filter present.
Thermostat	<input type="checkbox"/>	Set heat anticipator to amperage measured in control circuit or PMI.

Oil Heating Unit

Oil filter	<input type="checkbox"/>	Replace.
Nozzle	<input type="checkbox"/>	Replace after calculating heat-load. Nozzle GPH: _____ Nozzle Angle: _____°
Electrodes	<input type="checkbox"/>	Adjust gap and position in burner tube PMI.
Transformer	<input type="checkbox"/>	Clean contacts. Measure voltage; replace if voltage is not within PMI.
Burner assembly and burner tube assembly	<input type="checkbox"/>	Clean. Inspect for over burning. Replace flame retention head if damaged.
Combustion chamber	<input type="checkbox"/>	Clean. If necessary, repair combustion chamber or replace.
CAD/Stack Control Cell	<input type="checkbox"/>	Test. Verify that the burner shut off, PMI, when the cad cell is blocked from flame.
Flame Ignition	<input type="checkbox"/>	Test. Ignition must be instantaneous; Pre-purge type unit, blower on prior to ignition.
Barometric Damper	<input type="checkbox"/>	Plumb, level, swings freely.
Flue draft (before barometric damper)	<input type="checkbox"/>	Measure and adjust as needed. (10-15pa or 0.04-0.06 IWC or PMI).
Over fire draft	<input type="checkbox"/>	Measure and adjust as needed (5 Pa. or 0.02 IWC or PMI).
High limit control	<input type="checkbox"/>	Measure shut off temperature adjust or replace if >250F ⁰ (furnace), 180 F ⁰ (boiler).
Oil Pump Pressure	<input type="checkbox"/>	Measure, adjust to PMI.

NG or LP Heating Unit

Burners	<input type="checkbox"/>	Check for dust, debris, misalignment, flame impingement, and other flame-interference problems. Clean, vacuum, and adjust as needed.
Burner/Manifold	<input type="checkbox"/>	No soot, melted wire insulation, & rust in the burner & manifold area outside of firebox.
Pilot (if equipped)	<input type="checkbox"/>	Burning, good ignition, check safety control for gas valve shut-off when pilot is out.
Gas Pressure (IWC)	<input type="checkbox"/>	Input: _____ Manifold: _____

Test Results

Steady State Efficiency Test

Adjust to achieve combustion standards (Table 3-2 or 3-3).

SSE	O ₂ %	CO ppm	Smoke #	Flue F ⁰

Distribution Static Pressure

Measured in supply plenum and blower cabinet

Return Pressure	Supply Pressure	Air Flow Rate	Total Pressure	Max ESP on label

Temperature Rise

PMI. If no instructions see specifications.

Supply °F	Return °F	Total Rise (Supply-Return)

PMI Range

Min	Max

I certify that the visual inspection, repair, maintenance, and the performance tests were completed as indicated.

I certify that the heating system repair or maintenance work performed was to my satisfaction on the date indicated.

Installer's Signature _____

Date _____

Customer's Signature _____

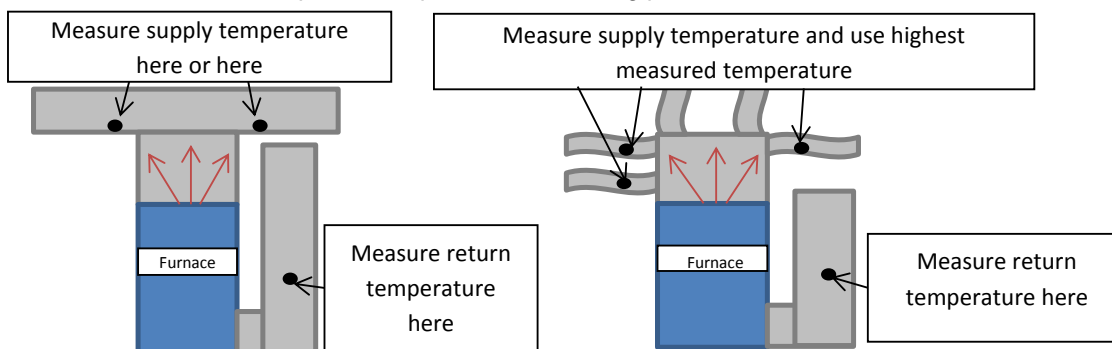
Date _____

Natural Gas, LP & Fuel Oil Specifications

Generally accepted ranges, excerpted from the Weatherization Field Guide.

Note: Always follow manufacturer's instructions, if they differ from listed specifications.

Examples of temperature rise testing procedures below



Acceptable Draft Test Readings for Gas Appliances with Respect to Outdoor Temperature					
°F	<20	21-40	41-60	61-80	>80
pa.	-5	-4	-3	-2	-1
IWC.	-.02	-.016	-.012	-.008	-.004

Table 3.2: Typical Ranges for Gas Burning Appliances

Performance Indicator	SSE 80+	SSE 90+
Carbon monoxide (CO) (ppm)	≤ 100	≤ 100
Stack temperature (°F)	325° - 450°	90° - 120°
Temperature Heat Rise (°F)	40° - 70°	30° - 70°
Oxygen (%O ₂)	4 - 9%	4 - 9%
Natural gas pressure output at manifold Inches of Water Column (IWC)	3.2 - 3.9	3.2 - 3.9
Propane pressure output at manifold (IWC)	10 - 11	10 - 11
Steady state efficiency (SSE)	82 - 86%	92 - 97%
Supply temperature (°F)	120° - 140°	95° - 140°

Table 3.5: Typical Ranges for Oil Burning Appliances

Performance Indicator	Non-Flame Retention	Flame Retention
Carbon monoxide (CO) (ppm)	≤ 100	≤ 100
Stack temperature (°F)	325° - 550°	300° - 450°
Oxygen (%O ₂)	6 - 9%	5 - 9%
Smoke number (1-9)	≤ 2	≤ 1
Excess air (%)	≥ 80%	≥ 35%
Oil pressure pounds per square inch (psi)	≥ 100	100 - 150
Over-fire draft (Inches of Water Column IWC negative)	.02 IWC or 5 Pa	.02 IWC or 5 Pa
Flue draft (IWC negative)	.04 - .01 IWC or 10 - 15 Pa	.04 - .01 IWC or 10 - 15 Pa
Steady state efficiency (SSE)	≥ 75%	≥ 80%

Comments: